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The majority of identified casualties among Veterans deployed to the Persian Gulf region are the result of blast-producing weaponry leading to Traumatic Brain Injury (TBI). Our proposed studies will identify molecular fingerprints from clinically assessable blood cells components as independent biological indexes that will promote early and correct TBI diagnosis. During the past year, we worked extensively with the Department of Defense Human Research Protection Office (DOD HRPO) to modify our protocols to fit DOD HRPO criteria. Our revised protocols have recently been approved by the DOD HRPO. We will not initiate any of our proposed studies until we receive local IRB approval for our revised protocols and that the DOD HRPO has received our local IRB approval documents and notify us that we can commence with the proposed studies.

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Introduction

Traumatic Brain Injury (TBI) is caused by a concussion insults to the head or a penetrating head injury that disrupts the normal function of the brain, leading to either transient or chronic impairments in physical, cognitive, emotional, and behavioral functions. The majority of identified casualties among Veterans deployed to the Persian Gulf region as part of service in Operations Enduring Freedom (OEF) or Iraqi Freedom (OIF) are the result of blast-producing weaponry. Overall, they have lower attention score, although it is not yet known if mild TBI might contribute to this observation. Nevertheless, veterans from prior conflicts exposed to blasts have shown evidence of mild TBI and attention difficulties when compared to similar veterans without blast exposure. Early diagnosis of chronic TBI is important in preventing further progression of symptoms that can disrupt a veteran's life upon return from service overseas. Mild TBI can be difficult to diagnose, and when coupled with psychological illness, can be either misdiagnosed or missed altogether. Traditionally, physicians and scientists have viewed and interpreted diseases at the 'visual' clinical level. With the advent of genomics and proteomics technologies, personalized medicine offers the promise and potential of uncovering the largely 'unseen' details of disease causality, onset, and progression. The proposed studies are to be conducted in collaboration with The War-related Illness and Injury Study Center (WRIIC), Department of Veteran Affairs, New Jersey Health Care System (DVANJHCS), East Orange, NJ and is designed to identify genomic-microRNA fingerprints from clinically assessable blood cell components as independent biological indexes that will allow us to identify unique molecular indexes of *Persistent Postconcussive Syndrome* as well as well as other significant injury-related factors associated with mild TBI in OEF/OIF Veterans.

Body

During the past year, we have not conducted any of our proposed studies. We will not initiate any of our proposed studies until we receive local IRB approval for our revised protocols and when the DOD HRPO receives our local IRB approval documents and notifies us that we can commence with the studies. The Department of Defense Human Research Protection Office (DOD HRPO) reviewed our protocols from the Bronx Veterans Affairs Medical Center (BCAMC) and from the DVANJHCS and identified a series of issues that needed to be corrected. In a series of communications with Dr. Parameshwar Mahasreshti from the DOD HRPO, we have revised our protocols from both the BVAMC and the DVANJHCS to meet the stipulations raised by the DOD HRPO. The revised protocols have recently been approved by the DOD HRPO. As per instructions from the DOD HRPO, we are submitting the revised and approved protocols to the BVAMC and the DVANJHCS for local institutional approval. As soon as we receive local institutional IRB approvals for our protocol from the BVAMC and the DVANJHCS, we will be forwarding local IRB approval documents to the DOD HRPO for final approval.

Key Research Accomplishments

During the past year, we have been working with Dr. Parameshwar Mahasreshti to revise our protocols to meet DOD HRPO requirements. The revised protocols have recently been approved by the DOD HRPO. We have not conducted any of our proposed studies in the past year. We will not initiate any of our proposed studies until we receive local IRB approval of our revised protocols and when the DOD HRPO receives our local IRB approval documents and notifies us that we can commence with the proposed studies.

Reportable Outcomes

N/A

Conclusion

IRB for local BVAMC and DVANJHCS is under review

References

N/A

Appendices

Pasinetti GM. Personalized medicine in veterans with traumatic brain injuries. To be presented at the Military Health Research Forum (2009). Abstract attached.

Personalized Medicine in Veterans with Traumatic Brain Injuries

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A large number of military personnel have been deployed in support of Operation Iraqi Freedom and Enduring Freedom (OIF/OEF). The Veterans Affairs office estimate about 6 percent of OIF/OEF veterans may suffer from traumatic brain injury (TBI). TBI is currently assessed using traditional clinical criteria that rely primarily on "visual" measures. Recent advents in molecular biological technologies offer the promise and potential of uncovering the largely "unseen" details on the onset and progression of TBI. In particular, this will be investigated in collaboration with the *War-Related Illness and Injury Study Center* (Dr. Gudrun Lange, Director) at the VA in East Orange, NJ. Our research program will allow for the first time the identification and eventually characterization of novel molecular markers, also known as *microRNA*, obtained from accessible circulating blood cells which will be used in the characterization of the biological features that might fit criteria for TBI diagnosis, relative to control cases. Collectively, our translational research program will allow for the first time the identification and characterization of novel "*molecular fingerprints*" that will potentially be used for identification of asymptomatic Veterans returning from the OIF/OEF who might be at high risk to develop TBI clinical-neuropsychological complications. The studies may achieve a consumer-related outcome to implement early preventative pharmaco-neuropsychological treatments within years 3-4 of the funding period.